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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/528,387

09/21/2005

Lesley Ann Key

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23117

7590

04/28/2009

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EXAMINER

OH, TAYLOR V

ART UNIT

PAPER NUMBER

1625

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/528,387	<b>Applicant(s)</b> KEY ET AL.	
	<b>Examiner</b> Taylor Victor Oh	<b>Art Unit</b> 1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **Final Rejection**

### **The Status of Claims**

Claims 1-9, and 11-16 are pending.

Claims 1-9, and 11-16 are rejected.

### **Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. The rejection of Claims 1-9, and 11-16 under 35 U.S.C. 102(b) as being anticipated clearly by Sunley et al (Catalysis Today 58 (2000) 293-307) has been withdrawn due to applicants' convincing argument.

### **Claim Rejections - 35 USC § 103**

Applicants' argument filed 1/21/09 have been fully considered but are not persuasive.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**The rejection of Claims 1-9, and 11-16 under 35 U.S.C. 103(a) as being unpatentable over Sunley et al (Catalysis Today 58 (2000) 293-307).**

The rejection of Claims 1-9, and 11-16 under 35 U.S.C. 103(a) as being unpatentable over Sunley et al (Catalysis Today 58 (2000) 293-307) has been maintained with reasons of record filed on 10/20/08.

**Applicants' Argument**

Applicants argue the following issues:

- a. When the high molar ratio of promoter to iridium is employed, there is an increased tendency for precipitation of the catalyst system to occur from the applicants' experience, which is disadvantageous because it results in the loss of expensive catalyst and promoter metals;
- b. Sunley is not concerned with the problem of catalyst system precipitation in Ir-catalyzed, Ru/Os/RH-promoted carbonylation process; furthermore, it states a

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total absence of any precipitates during the test of catalyst stability; also, it does recognize that catalyst precipitation can be a problem at molar ratios of Ru:Ir of greater than 2:1 since Sunley employ such a combination in a molar ratio of Ru:Ir (ex.13 and 14, table 2 ); thus, Sunley contains no suggestion of a solution to the problem of preventing catalyst precipitation.

Applicants' arguments have been noted, but the arguments are not persuasive.

First, regarding the first argument, the Examiner has noted applicants' arguments. However, unlike applicants' argument , according to the paragraph of 7.2.4. Catalyst stability, the visual inspection of a sample containing the iridium and a ruthenium promoter from the catalyst recycle stream of **the continuous unit** has turned out to be a total absence of any precipitates; this paragraph is obviously referred to Table 4 for **the continuous unit** data. In the Table 4 , there are surprisingly unexpected following data available for the molar ratios of Ru:Ir of greater than 2:1 (see ex. 9 and 10) as shown below:

Table 4

Continuous unit data: carbonylation rate and by-product make data for iridium and iridium/ruthenium catalysed methanol carbonylation<sup>a</sup>

Experiment	[Ir] (ppm)	[Ru] (ppm)	Temperature (°C)	[MeI] (%, w/w)	[MeOAc] (%, w/w)	[H <sub>2</sub> O] (%, w/w)	CO partial pressure (bar)	Carbonylation rate (mol dm <sup>-3</sup> h <sup>-1</sup> )	CO <sub>2</sub> rate (%)	CH <sub>4</sub> rate (% <i>R<sub>g</sub></i> )	Propionic acid (ppm)
1	1600	—	190.0	5.3	15.8	7.0	8.1	11.0	1.5	n.a.	530
2	3240	—	190.6	3.8	15.7	7.1	10.0	17.0	2.5	n.a.	930
3	1780	2320	190.0	5.1	15.1	7.2	8.3	17.1	1.6	n.a.	600
9	840	2330	189.0	10.0	21.9	4.6	8.8	19.8	0.63	0.91	360
10	870	2870	189.0	10.3	22.3	5.7	8.3	19.8	0.67	0.84	290

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In spite of employing the high molar ratio of promoter to iridium during the carbonylation process in the continuous unit, the sample containing the iridium and a ruthenium promoter from the catalyst recycle stream of **the continuous unit** has turned out to be a total absence of any precipitates. This is exactly opposite to the applicants' assertion. Thus, there is no significant disadvantage using the catalyst at molar ratios of Ru:Ir of greater than 2:1. Therefore, applicants' argument is not persuasive.

Second, regarding the second argument, the Examiner has noted applicants' arguments. However, in addition to a higher overall reaction rate by the use of a promoter, Sunley is mainly concerned with the followings:

- higher reactor productivity;
- an inherently stable catalyst system;
- lower production of propionic acid by-product;
- lower acetaldehyde production and hence an inherently purer product.

Also, Sunley is not concerned with the problem of catalyst system precipitation in Ir-catalyzed, Ru/Os/RH-promoted carbonylation process because it does not encounter that particular problem shown in the paragraph of 7.2.4. Catalyst stability. Furthermore, with respect to the high molar ratio of promoter to iridium (2 to 15 : 1), the prior art does teach that increasing the promoter to iridium molar ratio will ensure a possible three-fold increase in reaction rate, which can be achieved with ruthenium as shown in Fig 3 (see page 300); also, the actual experiments in Table 4 (see ex. 9 and 10) show that the carbonylation rate has been increased from 17.1 to 19.8 with the high molar ratio of

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ruthenium promoter to iridium ( $\text{Ru}:\text{Ir} = 5.3:1$ ). Therefore, it would have been obvious to the skilled artisan in the art to be motivated to increase the molar ratio of promoter to iridium in the prior art process so as to improve the rate for the carbonylation process. This is because the skilled artisan in the art would expect such a modification to be feasible and successful as shown in experiments (1-3 and 9-10) of Table 4 the purview of the skilled artisan in the art. Therefore, applicants' argument is not persuasive.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Andres can be reached on 571-272-0867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Taylor Victor Oh/  
Primary Examiner, Art Unit 1625  
4/26/09